WB Series

Installation
Operation
Maintenance
Manual

COLUMBIA®

COLUMBIA BOILER CO. OF POTTSTOWN
POTTSTOWN, PENNSYLVANIA 19464
www.COLUMBIABOILER.COM

Homeowner / Installer Policy

We at Columbia Boiler Company would like to “Thank You” for choosing our top of the line WB Wet Base Boiler. At Columbia Boiler we take pride in the serviceability and the quality construction of our products. We have built trusting relationships that date back through our company’s history to 1936. We believe that personal service is the best service and our customers agree.

We would like to offer you a few helpful service points to insure your family years of trouble free comfort. In order to maintain peak performance of your boiler, it is recommended that your boiler be maintained annually. Servicing of your appliance must be performed by a qualified oil heating technician. A properly trained oil technician will be prepared to set your boiler/burner combination with the proper tools necessary to achieve your maximum comfort and efficiency.

As a family owned business, we are happy to have you as one of our many satisfied homeowners who have been chosen Columbia boilers for over 70 years. We look forward to a long and continued relationship.

Rosemarie Bartchak
Sales and Marketing Manager
Columbia Boiler Residential Sales

Product Features

- ASME Coded Boiler Registered with National Board
- Fully Insulated Heat Exchanger with Powder-Coated Cabinet
- Packaged with Standard Five Gallon per Minute Tankless Coil (Domestic Hot Water)
- Equipped with Triple Aquastat, Circulator, and Temperature / Altitude Gauge
- Outfitted with Additional Nozzles to Achieve a Variety of Heat Inputs
- Provided with a Lifetime Limited Warranty
- Choice of Burners with factory installed quick connect harness for easy installation.
- Fully Insulated Powder Coated Cabinet.

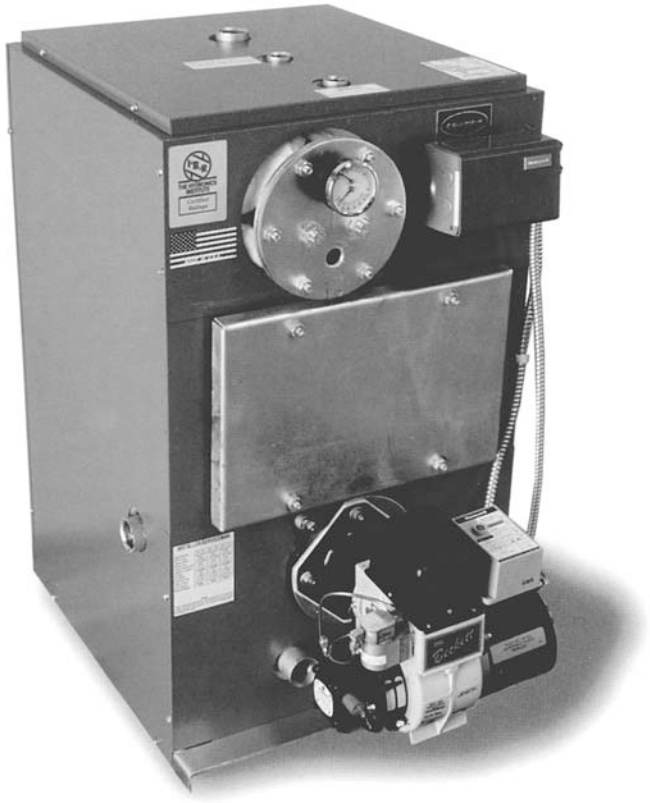

Figure 1 Columbia WB Series

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Model Specifications

Table 1 - Series I Boilers

	Model 90/100/110*			Model 125/135/150*		
Input	126,000	140,000	154,000	175,000	189,000	210,000
Heat Capacity	109,000	121,000	132,000	150,000	161,000	178,000
Gross Output	N/A	N/A	N/A	N/A	N/A	N/A
Net Out	95,000	105,000	115,000	130,000	140,000	155,000
Firing Rate	0.90	1.00	1.10	1.25	1.35	1.50
Tubes	10	10	10	16	16	16
Baffles	Fully Baffled	Fully Baffled	Fully Baffled	Fully Baffled	Fully Baffled	Fully Baffled
Water Content	30	30	30	28	28	28
Supply	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/4"
Returns (2)	1-1/4"	1-1/4"	1-1/4"	1-1/4”	1-1/4"	1-1/4"
Coil Capacity	5 GPM	5 GPM	5 GPM	5 GPM	5 GPM	5 GPM
Steady State	86.5	86.2	85.5	85.6	85.4	84.9
AFUE - DOE Efficiency	85.1	84.8	84.2	85.0	84.7	84.0
Combustion Efficiency	N/A	N/A	N/A	N/A	N/A	N/A
Overall Efficiency	N/A	N/A	N/A	N/A	N/A	N/A
Weight	458	458	458	485	485	485
Burner Model	Beckett AFG Beckett AFII Carlin EZ-1 Riello F5 Riello BF5	Beckett AFG Beckett AFII Carlin EZ-1 Riello F5 Riello BF5	Beckett AFG Beckett AFII Carlin EZ-1 Riello F5 Riello BF5	Beckett AFG Beckett AFII Carlin EZ-1 Riello F5 Riello BF5	Beckett AFG Beckett AFII Carlin EZ-1 Riello F5	Beckett AFG Beckett AFII Carlin EZ-1 Riello F5

*Model 90/100/110 and 125 available in choice of chimney or direct vent. With AFII, EZ1 and BF5 burners only.

Table 2 - Series II Boilers

	Model 165/175/200			Model 225/250/275		
Input	231,000	245,000	280,000	315,000	350,000	385,000
Heat Capacity	200,000	212,000	242,000	N/A	N/A	N/A
Gross Output	N/A	N/A	N/A	264,000	291,000	319,000
Net Out	174,000	184,000	210,000	230,000	253,000	277,000
Firing Rate	1.65	1.75	2.00	2.25	2.50	2.75
Tubes	18	18	18	24	24	24
Baffles	Not Baffled	Not Baffled	Not Baffled	Top Pass Baffled	Top Pass Baffled	Top Pass Baffled
Water Content	48	48	48	46	46	46
Supply	2"	2"	2"	2"	2"	2"
Returns (2)	2"	2"	2"	2”	2"	2"
Coil Capacity	5 (7 GPM opt.)	5 (7 GPM opt.)	5 (7 GPM opt.)	5 (7 GPM opt.)	5 (7 GPM opt.)	5 (7 GPM opt.)
Steady State	86.7	86.5	85.4	N/A	N/A	N/A
AFUE - DOE Efficiency	86.0	85.6	84.6	N/A	N/A	N/A
Combustion Efficiency	N/A	N/A	N/A	85.5	85.2	84.9
Overall Efficiency	N/A	N/A	N/A	83.7	83.3	82.9
Weight	680	680	680	710	710	710
Burner Model	Beckett AFG“M”	Beckett AFG“M”	Beckett AFG“M”	Beckett CF375	Beckett CF375	Beckett CF375

Model Dimensions

FIGURE 2 - SERIES I BOILERS

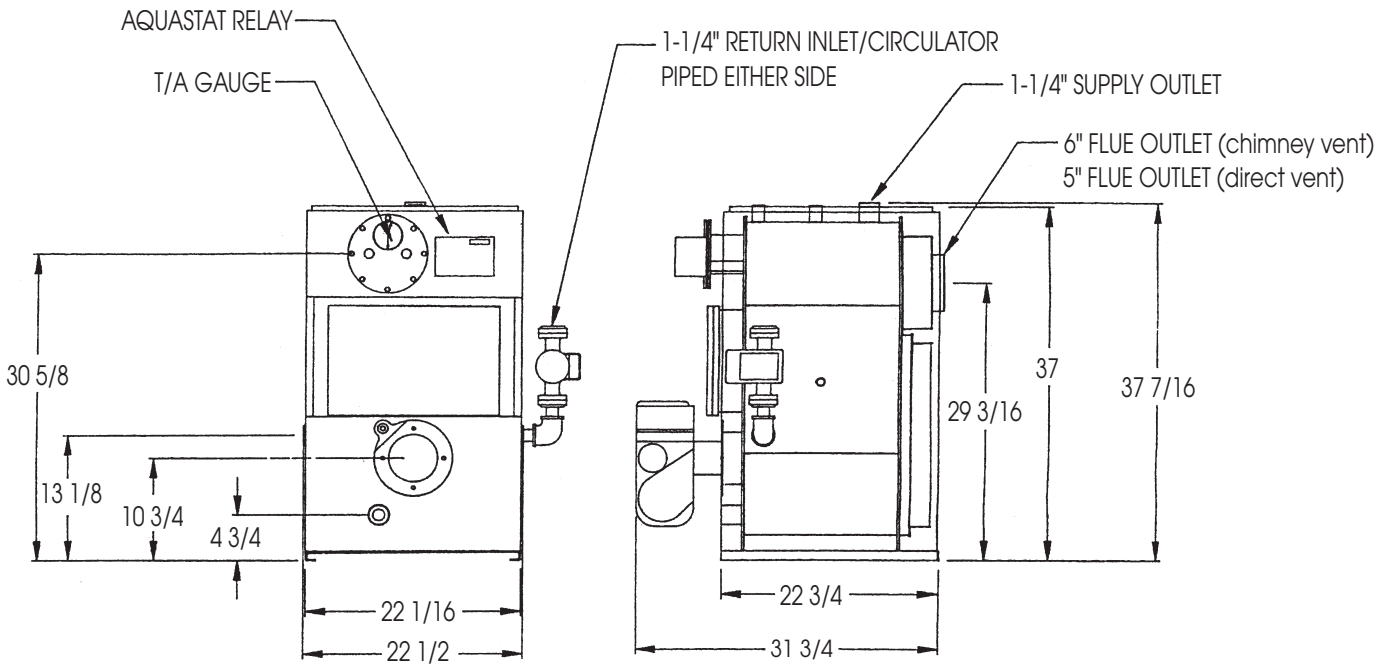
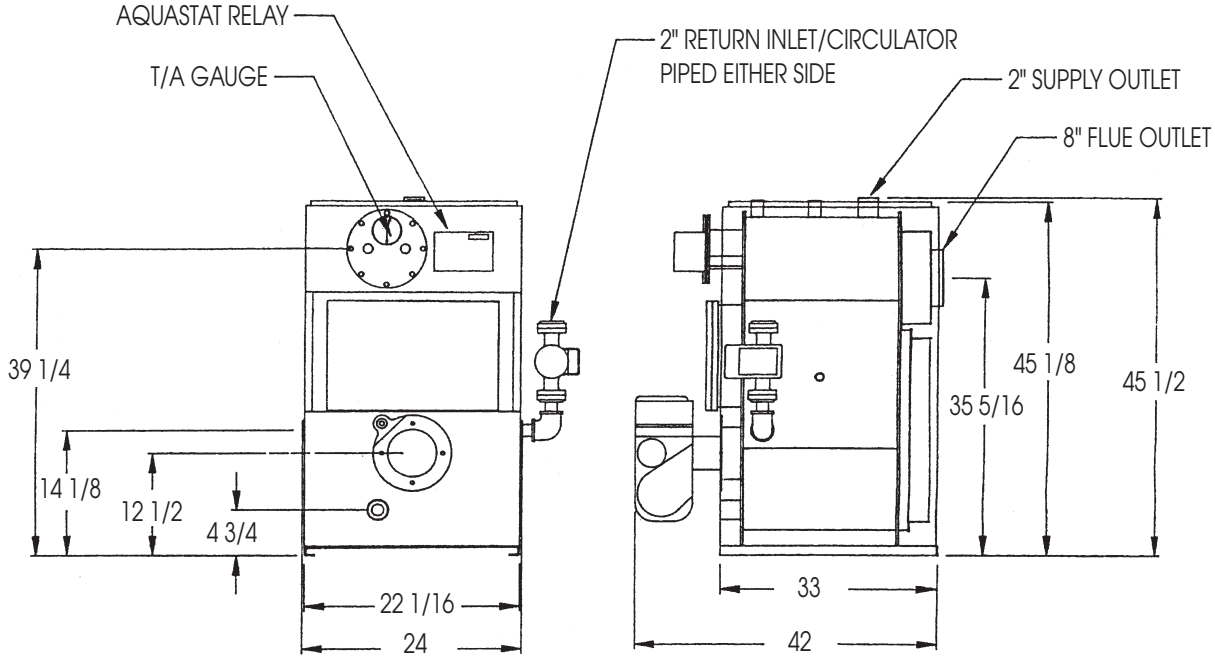


FIGURE 3 - SERIES II BOILERS



Installation

I GENERAL

This Series hot water steel boilers are high quality oil fired heating units. The installation of the unit shall be in accordance with state and local regulations. Refer to local Installation Codes for Oil Burning Equipment, for recommended installation practice.

II FREIGHT CLAIMS

All units should be inspected for damage upon arrival. Concealed damage claims should be filed immediately against the carrier by the consignor. The carrier is responsible for taking prompt action on all claims.

III SIZING

Replacement boilers should not be sized from the firing rate of the old boiler; a DOE sponsored study indicated 65% of the heating units in U.S. homes are substantially oversized.A complete heat loss calculation of the structure is necessary to choose the proper size unit to install. The boiler should be sized to within 25% of the actual calculated heat loss of the structure. Over sizing will result in short cycling and inefficient operation.

IV BOILER LOCATION

A) Boiler to be installed in a level position with clearances in accordance with NFPA 31 Table 10.6.1.

STANDARD CLEARANCES
Front 24"
Sides 6"
Top 18"
Rear 12"
Chimney Connector 18"
Floor: Sizes 90-150 may be installed on combustible flooring

B) Reduced clearance installations shall comply with NFPA 31 Table 10.6.2.
C) To move the unit, push against the flue box or skids. Pushing or pulling the jacket or burner will result in damage.
D) Be sure to level the unit by inserting shims under the elevated base.

V. AIR FOR COMBUSTION AND VENTILATION - CHIMNEY VENT APPLICATIONS

The unit must be installed where provisions exist for combustion and ventilation air. Ordinarily, provisions may be furnished by the following methods.

A) Utility Room or Closet
In buildings of tight construction, including most modern homes, you should provide an opening,

have a free area of not less than 1 square inch per 1000 Btu (140 square inch per US gph) of the total input for all appliances in the enclosure. One opening located near the top of enclosure and one near the bottom.

B) Basement

1. When a boiler is installed in a full basement, infiltration is normally adequate to provide air for combustion.
2. In buildings of tight construction when the basement windows are weather stripped, one opening to a well ventilated attic or with the outdoors should be provided. (See part A for opening requirements)

C) Special Conditions

When a boiler is located in an area where exhaust fans, kitchen ventilation systems, clothes dryers, or fireplaces may create conditions of unsatisfactory combustion or venting, special provisions should be made for additional air for combustion, as specified by local authority.

VI. AIR FOR COMBUSTION AND VENTILATION - DIRECT VENT APPLICATIONS

A) VENTING SYSTEM

CAUTION: EXTERNAL VENT SURFACES ARE HOT.
NOTE: USE ONLY THE ETL LISTED VENTING SYSTEM COMPONENTS SUPPLIED WITH THE TV-175 DIRECT VENT KIT.
SURFACE DISCOLORATION OF THE BUILDING MAY OCCUR DUE TO IMPROPER BOILER/BURNER ADJUSTMENT. COLUMBIA BOILER COMPANY WILL NOT ACCEPT ANY LIABILITY FOR SUCH DISCOLORATION.

Follow the instructions provided with the TV175 Direct Vent Kit for locating and installing the vent kit.

VII JACKET AND TRIM ASSEMBLY

A) Knock Down Boiler

1. *Jacket Assembly* - Unpack the jacket parts being careful not to damage the finish. Piping and accessories are installed after the jacket is in place.
2. *Trim Assembly*

a. Install the safety relief valve in the 3/4" tapping in the top of the boiler. The relief valve must be piped to a safe place of discharge.
b. Install the limit control in the 3/4" fitting provided in the boiler.
c. Install the altitude/temperature gauge in the 1/4" fitting provided in the coil plate.

B) Packaged Boiler

The boiler is supplied with a burner shipped in a separate box. To install the burner, follow the burner manufacturer's instructions included with the burner, then connect the wiring harness from the burner to the control using the quick connect fittings that are factory installed on the control and burner harness sections. See wiring diagram in this manual for details. Install the relief valve as noted in Section 2a (Trim Assembly).

VIII BOILER PIPING

See Figure 6 for recommended piping schematic.

This style of boiler is equipped with a built in "Air Scoop System." This feature allows quiet air free operation of your hot water system by assuring the removal of noisy air pockets. The supply line or Riser tapping in the top of the boiler extends approximately 1" below the top or waterline of the boiler, thus allowing only air free water to enter the supply to the heating system. The air trapped in the top of the boiler is then purged through a 3/4" vent tapping to be released with an (1) automatic float vent (2) a manual vent or (3) piped into a conventional type expansion tank.

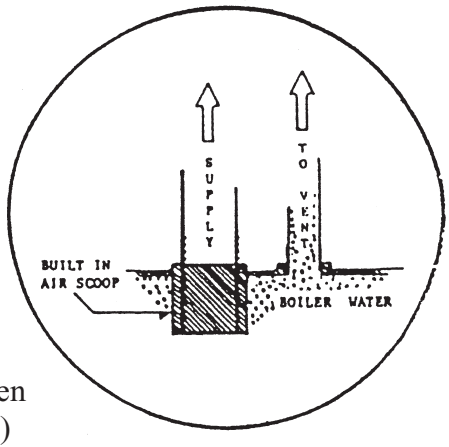


FIGURE 5
BUILT-IN AIR SCOOP

Relief valve discharges and drain valve piping must be piped to a safe place of discharge. All plugs and water connections should be checked for leaks upon installation and annually.

IX TANKLESS WATER HEATING PIPING

The tankless heater may be connected as shown in Figure 6. A mixing valve (not supplied) must be used to reduce the water temperature at kitchen or bathroom taps. High temperature water for a dishwasher may be obtained by piping as shown.

The nuts that secure the tankless coil flange must be tightened before the boiler is filled with water, after initial firing and every year during annual maintenance. Deterioration due to coil gasket leaks shall void warranty.

FIGURE 6 - PIPING DIAGRAM FOR SERIES I BOILERS

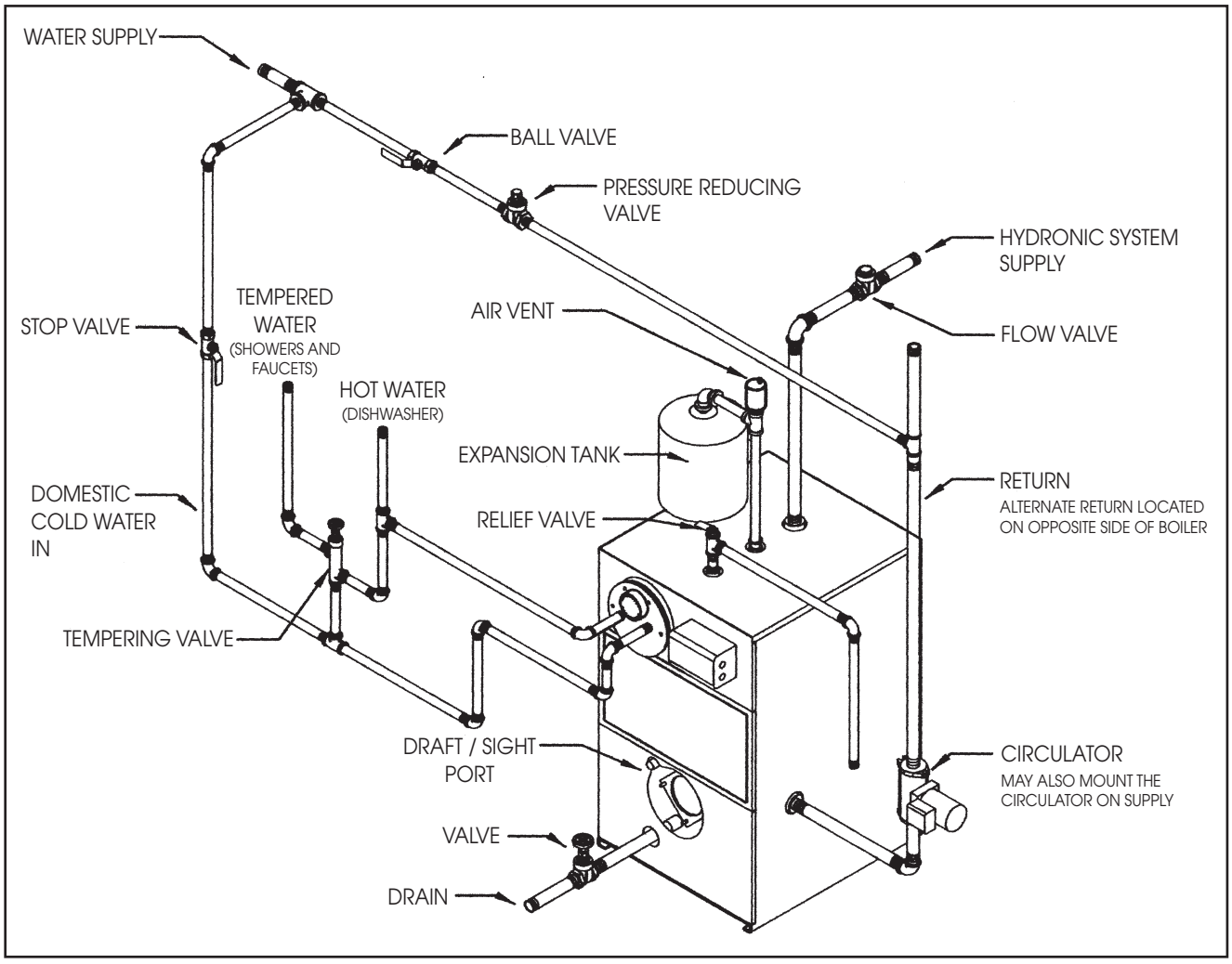
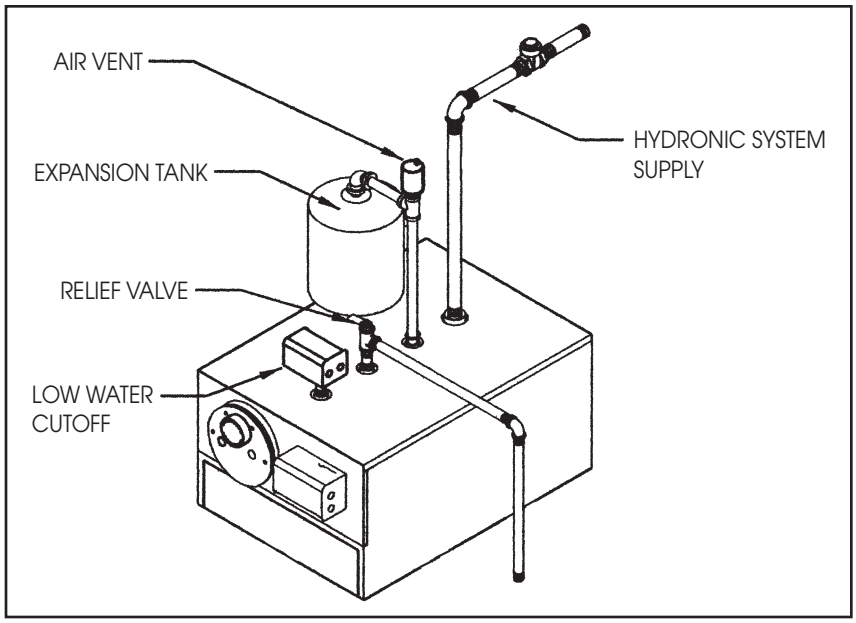
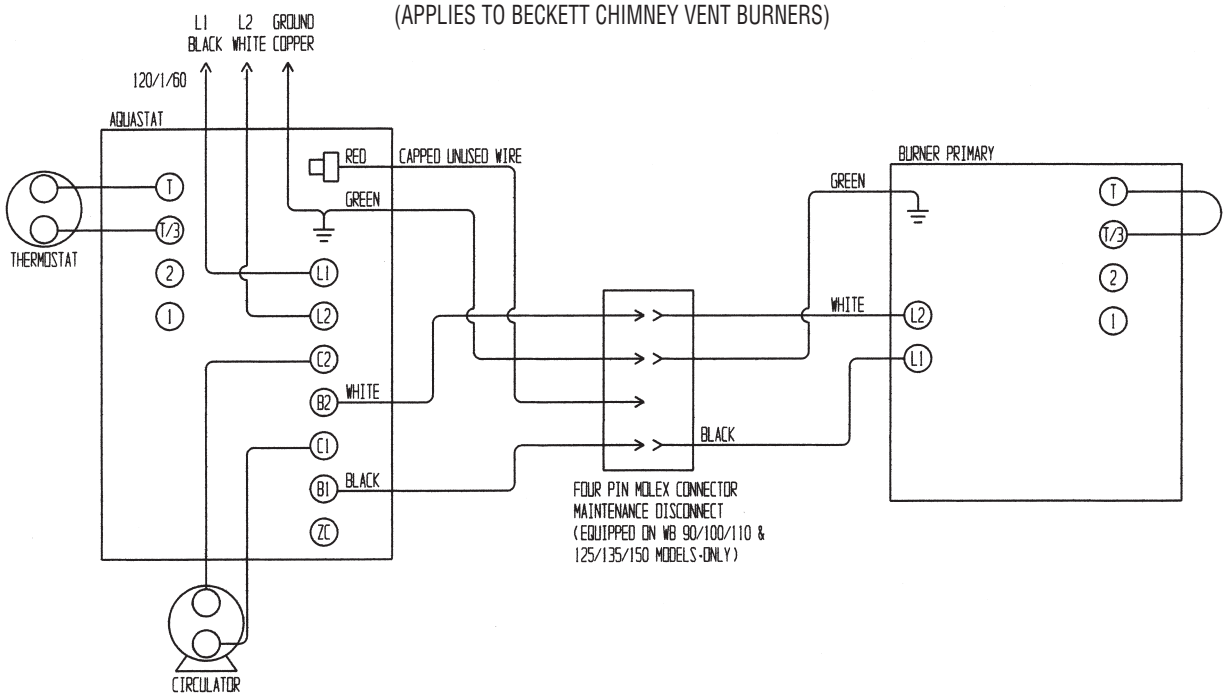


FIGURE 7 - PIPING DIAGRAM FOR SERIES II BOILERS (PIPING THE SAME EXCEPT THE ADDITION OF LOW WATER CUTOFF)



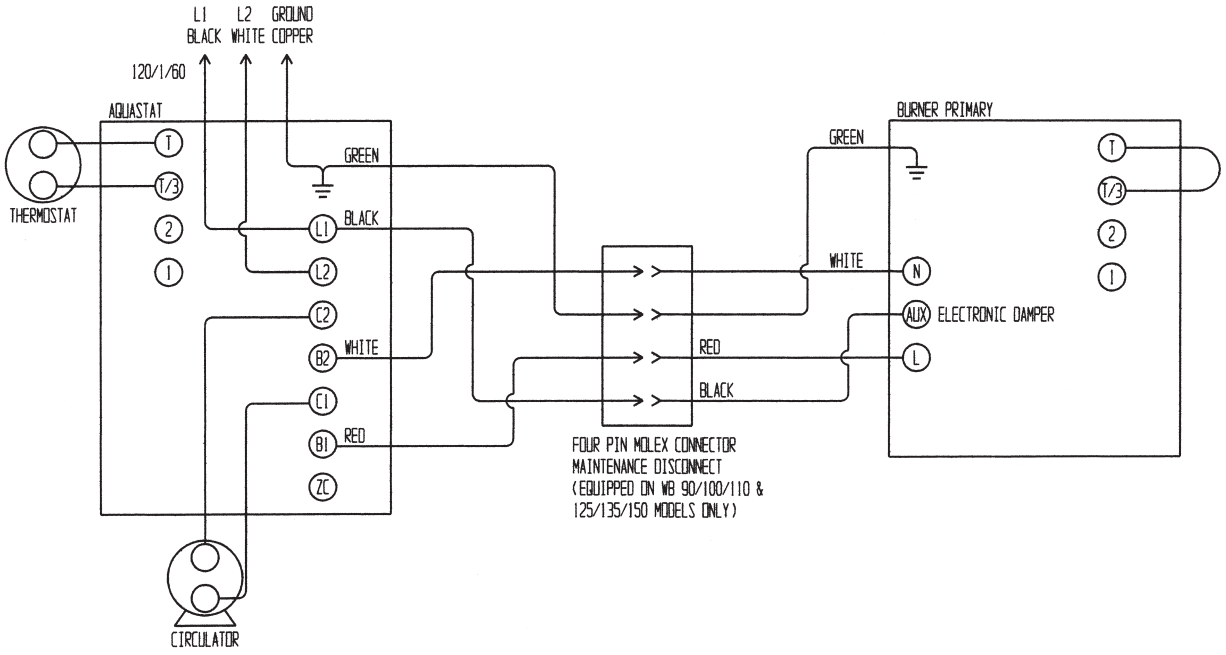
ELECTRICAL DIAGRAM FOR WB SERIES BOILERS TO CONNECT BURNER TO AQUASTAT

(APPLIES TO BECKETT CHIMNEY VENT BURNERS)



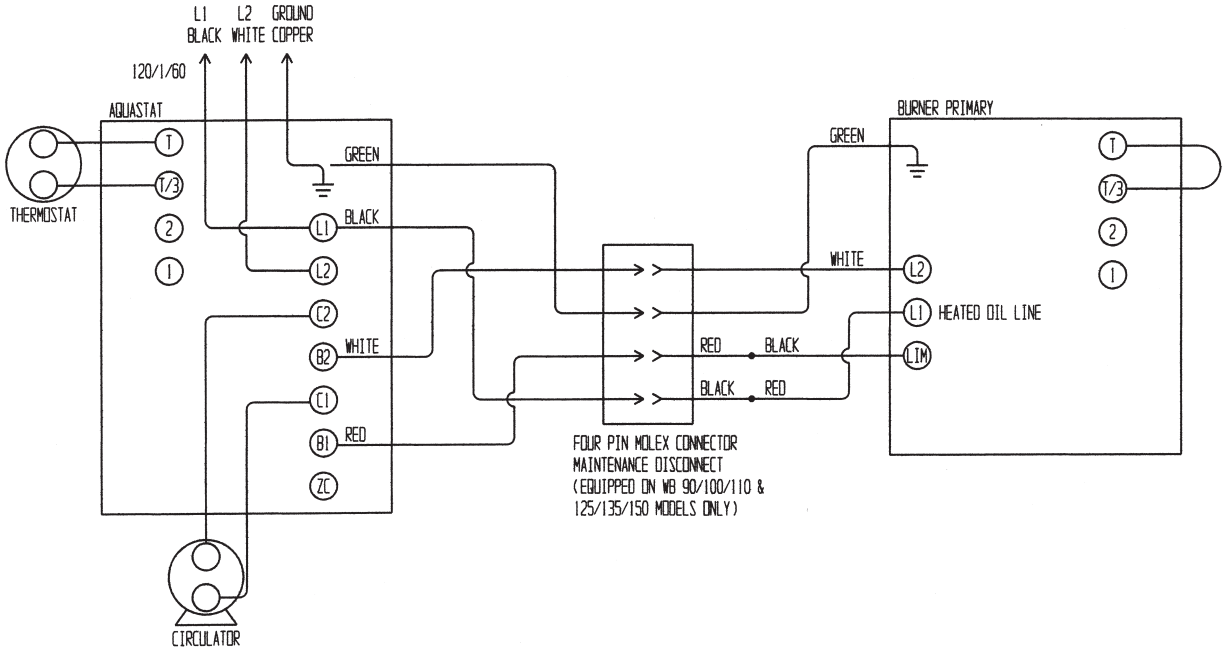
ELECTRICAL DIAGRAM FOR WB SERIES BOILERS TO CONNECT BURNER TO AQUASTAT

(APPLIES TO RIELLO CHIMNEY VENT BURNERS)



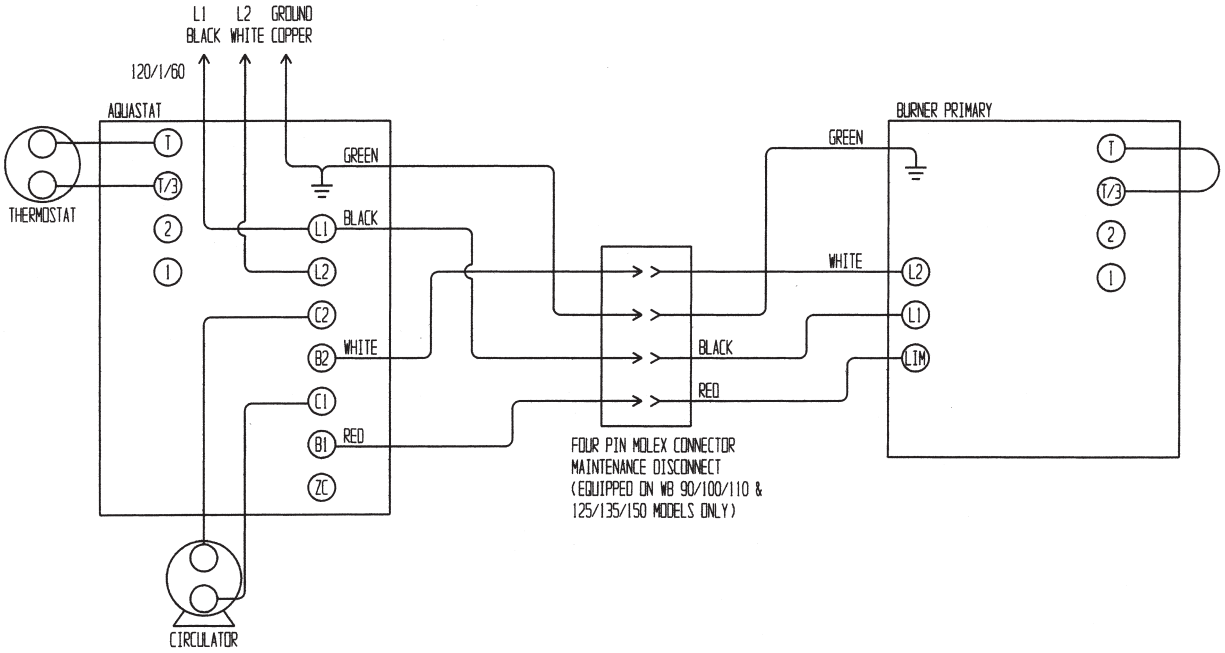
ELECTRICAL DIAGRAM FOR WB SERIES BOILERS TO CONNECT BURNER TO AQUASTAT

(APPLIES TO CARLIN CHIMNEY VENT BURNERS)



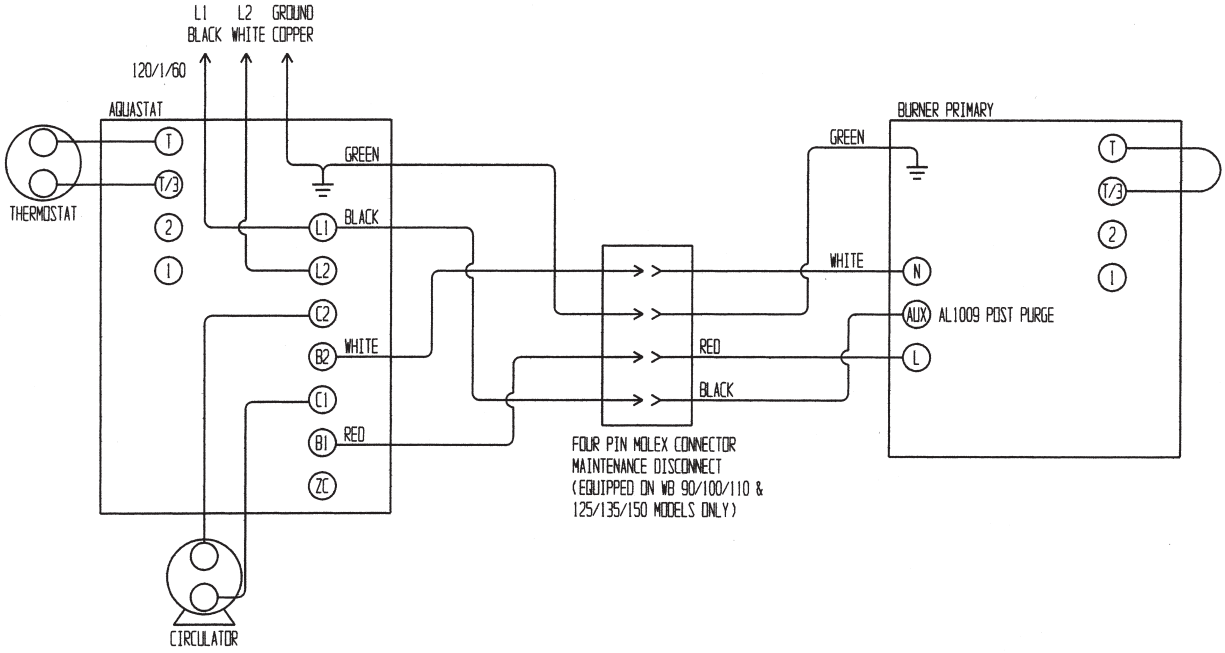
ELECTRICAL DIAGRAM FOR WB-DV SERIES BOILERS TO CONNECT BURNER TO AQUASTAT

(APPLIES TO BECKETT DIRECT VENT BURNERS)



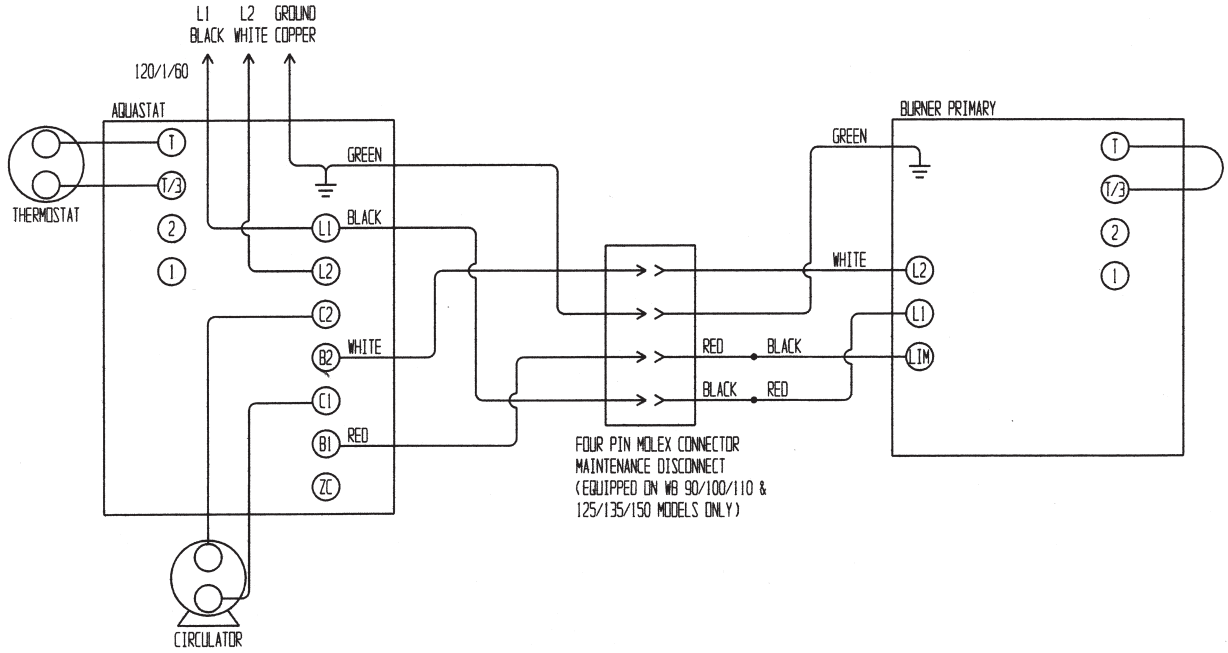
ELECTRICAL DIAGRAM FOR WB-DV SERIES BOILERS TO CONNECT BURNER TO AQUASTAT

(APPLIES TO REILLO DIRECT VENT BURNERS)



ELECTRICAL DIAGRAM FOR WB-DV SERIES BOILERS TO CONNECT BURNER TO AQUASTAT

(APPLIES TO CARLIN DIRECT VENT BURNERS)



X BURNER AND CONTROLS

A) Burner Installations

Packaged boilers are supplied with a burner shipped in a separate box. Boilers that are shipped knocked-down must be field assembled. Follow the procedures listed below to install and connect the burner.

1. Remove the burner parts and instructions from the carton.
2. Referring to specifications at the back of the manual, check to see that the burner model and size match the boiler model.
3. Make sure the correct nozzle is in place and is tightly sealed.
4. Check the electrode position and set the air intake as indicated in the burner manual.
5. The burner is installed with a mounting flange. The end of the burner air tube should be 1/4" from the inside surface of the front wall of the combustion chamber.
6. The burner is provided with a connector that should be attached to the mating connector installed on the aquastat at the factory. Wire the system in accordance with the appropriate suggested schematic in the control manufacturer's instruction manual. See the burner manufacturer's instructions for wiring details for the burner.
7. For units installed in Maine, New Jersey and New York, a low-water cutoff is required on all hot water boilers. See the burner manufacturer's instructoins for wiring the low water cutoff(s).

B) Oil Primary Control - Chimney Vent (Non Post Purge Control)

The oil primary control with the solid state flame sensing circuit provides automatic, non-recycling control of oil burners. When used with the cadmium sulfide flame detector, the control will automatically control the oil heating system.

The primary control will stop the oil burner within a predetermined number of seconds if the fuel fails to ignite or if the flame goes out during operation. The oil burner will remain off until the reset button on the relay has been pushed. **THE RESET MUST NEVER BE PRESSED MORE THAN ONCE DURING A SINGLE FLAME FAILURE.**

C) Oil Primary Control - Direct Vent (Post Purge Control)

The oil primary control with the solid state flame sensing circuit provides interrupted ignition. Used in conjunction with a cadmium sulfide flame detector, the control will automatically control the oil burner.

The primary control will stop the oil burner within a predetermined number of seconds if the fuel fails to ignite or if the flame goes out during operation. The oil burner will remain off until the reset button on the relay has been pushed. **THE RESET MUST NEVER BE PRESSED MORE THAN ONCE DURING A SINGLE FLAME FAILURE.**

Post-purge is provided to ensure that the boiler fires at maximum efficiency and dependability throughout the heating season.

Post-purge of the oil burner is controlled through the electronic circuitry supplied. Post-purge timing is variable. The factory set post-purge timing is at approximately one minute. It is recom-

mended that it be left at this setting. In no case should the post purge timing be reduced to less than 1 minute.

Length of Vent Kit	Minimum Post Purge Time
0 - 10 Feet	1 Minute
10.1 - 15 Feet	1 Minute
15.1 - 20 Feet	2 Minutes

Times are approximate and should be considered minimum settings for the length of intake pipe installed.

The length of post-purge may be increased on those units using the Beckett AFII or Riello BF-5 oil burners to any value up to its maximum setting if field conditions require a longer purge cycle.

The length of post-purge on the Carlin burner is not adjustable. The post purge timing on the Carlin burner is 90 seconds.

D) Aquastat Relay

This control is installed in the 3/4" fitting next to the domestic coil. These immersion type controls are used with forced hydronic heating systems which include domestic water service. This model provides high and low limits for maintaining minimum boiler water temperature and circulator controls. This control can also be used for multi-zone control by using a separate circulator and an R845 relay for each zone. See the control manufacturer's instructions for proper wiring of this unit. The primary control is factory wired to the aquastat relay. These controls, working as a system, will prevent the circulator operation if the water temperature is below a predetermined low level. Likewise, if the water level reaches a predetermined high limit, the burner will automatically shut off.

XI SEQUENCE OF OPERATION

Forced Circulation Hot Water System with Tankless Heater

When room temperature falls below thermostat setting, the thermostat calls for heat starting the circulating pump. The burner and pump continue to operate until room heating requirements are satisfied (thermostat setting is reached), or until boiler water temperature reaches high limit control temperature setting. If the high limit control temperature setting is reached, the burner shuts off, the circulating pump continues to operate until the room heating requirements are satisfied. If the thermostat continues to call for heat after the boiler water temperature has dropped below the temperature setting of the high limit control the oil burner will start again, while the circulating pump will continue to run.

The boiler water temperature is normally maintained at 180°F around the tankless coil by the operating control so that an abundance of hot water is available. If the boiler water temperature should fall below the operating control setting (180°F), the oil burner will be started again by that control (and the circulating pump will be prevented from operating) until the operating control setting is satisfied.

A cadmium sulfide flame scanner (cad cell) is provided with the oil burner. The cad cell will stop the oil burner within a predetermined number of seconds if the fuel fails to ignite or if the flame extinguishes during operation. The oil burner will remain off until the red reset button on the relay has been pushed. (Reset must never be pressed more than once during a single flame failure.)

XII FUEL SYSTEM

A) Fuel Units

NOTE: Pump pressure 140 PSI for Beckett and Carlin, and 150 PSI for Riello.

1. Burners are commonly fitted with a single stage fuel unit. A single stage unit may be connected with a supply line only, when the fuel supply is level with or above the burner. When the burner is above the oil level, a return line should be provided between the fuel unit and the tank. A “by-pass” plug in the fuel unit is then required. The return line automatically purges air from fuel units and returns it to the tank.
2. Two stage fuel unit. If the height difference between the burner and the fuel supply level exceeds 10 ft., a two stage unit should be used, and a return line should be installed.

B) Tubing

Use continuous heavy walled copper tubing with flare fittings only. Locate fittings in accessible locations. If possible, tubing should be installed under the floor. Running tubing against boiler casings or across ceiling or floor joints should be avoided.

C) In-Line Oil Filter

The oil filter should be of a generous capacity. It should be located inside the building between the tank shut off valve and the burner. A shut off valve and the oil filter should be located as close to the burner as possible for ease of servicing.

D) Oil Shut Off Valve
Install manual oil shut off valves at the burner and near the tank on the supply line. Both valves should be easily accessible.

XIII FLUE SYSTEM - CHIMNEY VENT APPLICATIONS

A) General
AN OIL FIRED UNIT SHALL BE CONNECTED TO A FLUE HAVING SUFFICIENT DRAFT AT ALL TIMES TO ASSURE PROPER OPERATION.

B) Draft
The draft regulator should be installed in accordance with the manufacturers instructions. Set the draft to negative .02 to .04 inches W.C. in the stack.

C) Roof Clearances
The flue gas exit of the venting system should be at least 3 feet above the highest point where it passes through the roof and at least 2 feet higher than any portion of a building with 10 feet of the venting system.

D) Chimney Connectors
The connector should be pitched upward at least 1/4 inch to the foot. Use only high quality lock seam smoke pipe. Each joint should be securely fastened with sheet metal screws. Chimney connectors should be positioned to the shortest possible run of smoke pipe to the chimney.

E) Vent Cap
Install a U.L. listed vent cap where the possibility of down drafts exist.

F) Boiler Venting
This boiler must be vented into a properly sized chimney, or into an Underwriters Laboratories Inc. listed venting device which is capable of maintaining the specified draft requirements.

Only a trained experienced serviceman should attempt the installation or service of any boiler and or venting device.

All venting installations must comply with the recommendations of the venting manufacturer and with all state and local codes.

XIV WIRING

All internal electrical wiring is completed at the factory on packaged boilers. All external wiring must conform with the National Electric Code and local codes. Refer to burner and control wiring diagrams for all field wiring.

A) Field connections should be protected with a 15 amp fuse.

B) Install the room thermostat on an inside wall away from cold drafts, windows, or heat from fireplaces, appliances, or sunlight. Connect the thermostat leads to the “TT” terminals on the circulator control.

C) A separate service box with disconnect switch is provided, wired but not fastened to the jacket. Connect the service box to the jacket using the hole and screw provided.

XV WARRANTY

The limited warranty is not applicable unless these installation instructions are followed.

Operation

I START UP

DO NOT START UNLESS CLEAN OUT DOORS ARE IN PLACE.

A. Make sure service switch to boiler is off.

B. Make sure boiler has been filled with enough water until the entire system has been purged and desired pressure is obtained.

C. Check to make sure the oil storage tank is filled with No. 2 heating oil.

D. Make sure all manual shut off valves in the fuel system are open.

E. Set operating controls at 180°F.

F. Set limit switch at 200°F.

G. Install a pressure gauge in the 1/8" gauge nozzle port, or bleed valve port of the fuel pump. **The pressure should be set per Installer/Serviceman Label.**

H. Adjust the burner air band and air shutter in accordance with Installer/serviceman Label.

I. Push the safety reset button on the primary control and release. Adjust the thermostat to call for heat. Turn the service switch to the on position. Bleed the fuel unit. If burner fails to start, refer to the trouble shooting guide in this manual.

J. With the burner running, bleed the fuel unit again until all air is eliminated from lines. Close and tighten the bleed port.

K. Check all lines and plugs for oil leaks and eliminate.

II START UP ADJUSTMENTS

A) Equipment Required

1. CO2 analyzer
2. Draft gauge.
3. Fuel pressure gauge.
4. Stack thermometer.
5. Smoke tester.

B) Burner Adjustments

Allow the burner to operate steadily for at least 15 minutes. Check the burner settings according to the installer/serviceman labels for Series I and II boilers starting on page 30, and make the following adjustments:

1. *Sampling Hole* - punch 1/4" hole in the flue between the flue box and the draft regulator. All test readings should be taken from this point.
2. *In The Stack Draft* - Take a draft reading from the flue pipe sampling hole. Adjust the barometric draft regulator to -.02" in the stack. In tall chimneys a second draft regulator may be required in the flue pipe to regulate draft under high draft conditions.
3. *Overfire Draft* - Take a draft reading from the draft port located to the left of the burner. Compare the readings with those according to the installer/serviceman labels for Series I and II boilers starting on page 30. Reinstall the draft port plug after all readings have been taken.
4. *Pump Pressure* - **Adjust the pump discharge pressure per value on serviceman label.**
5. *Combustion Air* - Reduce the air supply to allow just sufficient air for clean combustion. This is accomplished by loosening the lock screws on the air shutter, and closing the air shutter until a trace of smoke is recorded. Take a CO2 sample. Open the air shutter lowering CO2 about 1-1/2% to 2%. A zero smoke reading should result. If this adjustment cannot be obtained, refer to the trouble shooting section in this manual..

C) Instructing the Homeowner

The care and operation of the boiler should be explained to the homeowner, including care of the burner, how to adjust the thermostat, necessity of air supply to the burner, and the simple checks to make before calling the serviceman if the burner fails to operate automatically.

III BURNER SERVICING

A) Burner Components

If a replacement part is necessary, use only the part specified on the burner parts list in this manual. Specify the part number and description when ordering. (See included burner literature).

B) Nozzles

Use only the correct nozzle specified on the “Installer/Serviceman” decal located on front boiler jacket. Be extremely careful not to touch the nozzle orifice to avoid scratches or dirt which may cause leaks or effect the oil spray pattern.

C) Electrode Settings

The electrode setting is critical for proper ignition of the fuel. Check to be sure electrode settings comply with the specifications.

D) Fan and Blower Housing

The fan and blower housing should be kept clean from lint and dirt. If the boiler is located near an unvented dryer, special care must be taken so that lint does not block air passages in the burner and proper combustion air is provided.

IV HOMEOWNER INFORMATION

Your Serviceman/Service Company is:

Address:

Phone No.:

A) General
Never burn garbage or refuse in your heating unit. Never try to ignite oil by tossing burning papers or other material into your boiler and never leave combustible material around it. Do not allow the fuel tank to run out of oil. The fuel tank should be kept full during the summer or periods of non-use, to prevent condensation of moisture on the inside of the tank.

B) Combustion Air Supply
Your burner requires an ample amount of clean combustion air in order to completely and efficiently burn fuel. If an ample supply is not available erratic operation, noisy combustion, and fuel odors in the air may result. Remember that venting fans or a vented dryer will greatly increase the need for outside air.

C) Filter
Replace the cartridge filter in the line every year to avoid fuel unit and nozzle contamination.

D) Area Around Boiler
The area around the boiler should be kept clean and free of any combustible materials, particularly oily rags or papers. The boiler should be accessible for ease of service. If the burner is shut down for an extended period of time, shut off the manual fuel supply valve. Follow starting procedures to restart.

V SERVICE INFORMATION

To avoid unnecessary expense and inconvenience, the boiler and burner should be inspected at least once a year by a qualified serviceman. If difficulty occurs, the following should be observed before calling the serviceman.

A) Check to be sure there is fuel in the tank.
B) Check to see if the thermostat setting is above room temperature.
C) Check to see if the service switch is in the on position.
D) Do not tamper with the unit or its controls.

Maintenance

I IMPORTANT

ESCAPING GASES ARE DANGEROUS. THE ENTIRE FLUE AND VENTING SYSTEM SHOULD BE INSPECTED AT LEAST ONCE A YEAR BY A QUALIFIED SERVICEMAN.

II OIL FILTER

The oil filter cartridge should be replaced annually.

III CLEANING

The heat exchanger and combustion chamber should be examined annually for scale and soot accumulation. The heat exchanger examination and cleaning is to be performed through the front clean out panel located above the burner.

A) To clean the unit, Remove the 3/8" brass nuts, clean out cover, and front refractory board.
B) Remove baffles from front. Brush all of the tubes using a 2" soft flue brush.
C) Remove the flue pipe and check for any residue through the flue collector opening. A boiler vacuum can be used to collect any soot and scale. It is not normally necessary to remove the flue box for cleaning.
D) Remove the oil burner to inspect the burner head. Any soot or scale can be removed from the chamber through the burner opening.

DO NOT REMOVE THE REAR COVER AND REAR REFRACTORY FOR NORMAL MAINTENANCE. SOOT OR SCALE MUST BE REMOVED FROM THE FRONT BURNER OPENING ONLY.

IV OIL BURNER

A) Thoroughly brush clean the burner fan blades. Only with clean fan blades is proper combustion air delivery possible.
B) Clean nozzle assembly and all air handling parts.
C) Check spacing and condition of the ignition electrodes.
D) Nozzles should be inspected every year for plugged distributor slots or plugged orifices. If it is necessary to replace the nozzle, use only the specified nozzle to be sure that the replacement meets the spray pattern specifications of the burner.

V GASKETS

Tighten the nuts on the water coil annually to prevent any gasket leaks. Deterioration due to coil gasket leaks shall void the warranty.

VI WIRING

Check the electrical wiring for damage or frayed insulation.

Troubleshooting Guide

TROUBLE: BURNER DOES NOT START

SOURCE	PROCEDURE	CAUSES	REMEDY
Thermostat	Check Thermostat	Thermostat set too low.	Turn thermostat up.
		Thermostat on "off" or "cool."	Switch to heat.
		Open thermostat wires.	Repair or replace wires.
		Loose thermostat connectors.	Tighten connection.
		Faulty thermostat.	Replace thermostat.
		Thermostat not level.	Level thermostat.
Circuit Overloads	Check burner motor overload switch. (If equipped)	Burner motor tripped on overload.	Push reset button.
	Check primary control safety switch.	Primary tripped on safety.	Reset safety switch.
Power	Check boiler disconnect switch and main disconnect switch.	Switch open.	Close switch.
		Tripped breaker or blown fuse.	Reset breaker or replace fuse.
Cad Cell	Jump the FF terminals on primary control, if the burner starts, fault is in detector circuit.	Open cad cell wires.	Repair or replace wire.
		Dirty cell face.	Clean or replace face.
		Faulty cad cell.	Replace cad cell.
	Check resistance across cad cell.	If 400-600 ohms cell is bad.	Replace cad cell.
Primary Control	Check for line voltage between the black and white leads. No voltage indicates no power to the control.	Limit control switch open	Check limit setting.
			Jump terminals - if burner starts replace control.
		Open circuit between limit control and disconnect switch.	Repair circuit.
		Low line voltage or power failure	Call utility company.
	Check for line voltage between orange and white leads. No voltage indicates a faulty control.	Defective control.	Replace control.
Burner	Check for voltage at the black and white leads to the burner motor. Voltage indicates power to motor and a fault in the burner.	Pump seized.	Turn off power to burner. Rotate blower by hand, check for excessive drag. Replace fuel unit or blower wheel.
		Blower wheel binding.	
		Burner motor defective.	Replace burner motor.

When checking burner adjustments always use instruments.

TROUBLE: BURNER STARTS BUT DOES NOT ESTABLISH FLAME

SOURCE	PROCEDURE	CAUSES	REMEDY
Oil Supply	Check tank for oil.	Empty tank.	Fill tank.
	Check for water in oil tank using a dip stick coated with litmus paste.	Water in oil tank.	Strip tank of water exceeding 2" in depth.
	Listen for pump whine.	Fuel supply valve closed.	Open valve.
Oil Line and Filter	Open pump bleed port and start burner. Milky oil or no oil indicates loss of prime.	Air leak in fuel system.	Repair leak, using only flared fittings. Do not use Teflon tape on oil fittings.
	Listen for pump whine.	Oil filter plugged.	Replace filter cartridge.
		Plugged pump strainer.	Clean Strainer.
		Restriction in oil line.	Repair oil line.
Oil Pump	Install pressure gauge in port of fuel pump. Pressure should be according to the installer/service-man labels for Series I & II boilers starting on page 29.	Pump worn - low pressure. Motor overloads.	Replace pump.
		Coupling worn or broken.	Replace coupling.
		Pump discharge pressure set too low.	Set pressure according to the installer/serviceman labels for Series I & II boilers.
Ignition Transformer	Connect transformer leads to line voltage. Listen for spark. Check that transformer terminals are not arcing with buss bars. Check that transformer is properly grounded.	No spark or weak spark.	Replace transformer.
		Line voltage below 102V.	Call utility company.
Ignition Electrodes	Remove and inspect drawer assembly.	Carboned and shorted electrodes.	Clean electrodes.
		Eroded electrode tips.	Replace and reset electrodes.
		Incorrect electrode settings.	
		Cracked porcelain insulators.	Replace and reset electrodes.
Nozzle	Check for faulty nozzle.	Plugged orifice or distributor. Plugged nozzle strainer. Poor spray pattern.	Replace nozzle with nozzle according to the installer/ serviceman labels for Series I & II boilers .
	Inspect nozzle for correct size and specifications.	Incorrect nozzle installed.	Install correct nozzle.
Combustion Air Adjustments	See "Burner Adjustment Instructions" in this manual.	Air shutter open too far.	Decrease air shutter setting.
		Air band open too far.	Decrease air band opening.

When checking burner adjustments always use instruments.

TROUBLE: BURNER FIRES, BUT THEN FAILS ON SAFETY

SOURCE	PROCEDURE	CAUSES	REMEDY
Cad Cell	Check cad cell with ohmmeter. If more than 2000 ohms, cad cell is defective or dirty.	Faulty or dirty cad cell	Clean or replace cad cell.
Primary Control	After burner fires, open cad cell circuit if flame looks OK. If burner continues to operate, fault is in primary control.	Faulty primary control	Replace primary control.
Heat Exchanger Restriction	Inspect heat exchanger.	Plugged heat exchanger.	Clean out heat exchanger.
Burner Motor	Burner motor trips on overload. Turn off power and rotate blower by hand to check for excessive drag.	Line voltage below 102V	Call utility company.
		Faulty motor.	Replace motor.
		Pump or blower overloading motor.	Replace blower or pump.

TROUBLE: TOO MUCH HEAT

SOURCE	PROCEDURE	CAUSES	REMEDY
Circulator	Check to see if operating control is working properly.	Circulator does not stop running.	Repair operating control.
Thermostat	Check thermostat settings and calibration.	Thermostat set too high.	Reset thermostat.
		Thermostat defective	Replace thermostat.
		Thermostat out of calibration.	Recalibrate. Check level.
Flow Valve	Check to see if flow valve is operating properly.	Flow valve dirty and stuck.	Clean flow valve.
		Flow valve defective.	Replace flow valve.

When checking burner adjustments always use instruments.

TROUBLE: BURNER FIRES, BUT THEN LOSES FLAME

SOURCE	PROCEDURE	CAUSES	REMEDY
Poor Fire	Inspect flame for stability.	Unbalanced fire.	Replace nozzle with specified nozzle.
		Excessive draft.	Reduce draft setting.
		Insufficient draft.	Increase draft.
		Insufficient combustion air sources.	Increase combustion air sources.
Oil Supply	If burner loses flame prior to the primary control locking out, fault is in fuel system.	Air leak in fuel system.	Repair leak - use only flare fittings.
		Water in oil tank.	Strip tank of water exceeding 2" in depth.
		Fuel supply valve closed.	Open valve.
		Restriction in oil line.	Clear oil line restriction.
		Plugged fuel filter.	Replace filter cartridge.
		Plugged pump strainer.	Clean Strainer.
		Cold oil.	Use #1 heating oil.
Combustion Air	Reduce combustion air supply.	Too much combustion air.	Close air band and air to raise CO2. Check with instruments.
Pump	Install pressure gauge in gauge port of fuel pump. Pressure should be according to installer/ serviceman labels for Series I & II boilers starting on page 29.	Pump discharge pressure incorrectly set.	Set pressure according to installer/serviceman labels for Series I & II boilers.
		Coupling worn or broken.	Replace coupling.
		Pump worn - low pressure motor overloads.	Replace pump.
Excessive Draft	Take a draft reading. Draft should be according to installer/service-man labels for Series I & II boilers starting on page 29 in stack.	Incorrect draft setting.	Reduce setting. Install second draft regulator if necessary.
Poor Flue Gas Sample	Insert CO2 probe into heat exchanger tube. If reading is greater by 1/2% or more, sample was being diluted near flue box.	Leak in flue system.	Sample CO2 in heat exchanger.
			Seal flue system leak.
Testing Method	Using a chemical absorption type device, let instrument set after a test before venting. If CO2 reading increases 1/2% fluid is weak.	Weak fluid.	Replace fluid in testing device.
Nozzle	Check for faulty nozzle.	Plugged orifice or distributor.	Replace nozzle with specified nozzle.
		Plugged nozzle strainer.	
		Poor spray pattern.	

When checking burner adjustments always use instruments.

TROUBLE: BURNER FIRES, BUT PULSATES

SOURCE	PROCEDURE	CAUSES	REMEDY
Draft	Take a draft reading. Draft should be according to installer/service-man labels for Series I & II boiler starting on page 29, in the stack.	Down drafts.	Install vent cap.
		Insufficient draft.	Increase draft setting.
		Excessive draft.	Reduce draft settings, install second draft regulator if necessary.
Draft Regulator	Inspect draft regulator for correct location on flue system.	Improper installation.	Move draft regulator to correct location.
Combustion Air See Table 1.	Inspect installation for combustion air provisions.	Improper installation.	Provide sufficient sources of air for combustion.
	Open air band wide and take CO2 reading.	Improper adjustment.	Adjust CO2 level - start with air band wide open. Use instrument.
Oil Supply	Bleed pump; inspect for air leaks or water contamination.	Air leak in fuel system. Compression fittings.	Repair leak - use only flare joints.
		Water in oil tank.	Strip tank of water exceed 2" in depth.
Pump Pressure	Install pressure gauge in gauge port of fuel pump. Pressure should be according to installer/ serviceman labels for Series I & II boiler starting on page 29.	Pump discharge pressure incorrectly set.	Set pressure according to installer/serviceman labels for Series I & II boiler.
		Coupling worn or broken.	Replace coupling.
		Pump worn - low pressure motor overloads.	Replace pump.
Nozzle	Check for faulty nozzle.	Plugged orifice or distributor.	Replace nozzle with nozzle specified on burner housing.
		Plugged nozzle strainer.	
		Poor spray pattern.	
Heat Exchanger Restrictions	Inspect heat exchanger.	Plugged heat exchanger.	Clean out heat exchanger.

When checking burner adjustments always use instruments.

TROUBLE: INSUFFICIENT HEAT

SOURCE	PROCEDURE	CAUSES	REMEDY
Circulator	Check if circulator is operational.	Coupling worn or broken.	Replace coupling.
		Pump binding.	Replace pump.
		Circulator motor burned out.	Replace circulator motor.
		Wiring from operating control defective.	Repair wiring.
		Operating control defective.	Repair or replace operating control.
	Check if circulator is correct size.	Circulator too small.	Replace with proper circulator.
	Check if circulator is up to speed; check if voltage to circulator is sufficient.	Circulator defective.	Repair circulator.
		Insufficient voltage.	Call utility company.
Thermostat	Check thermostat settings.	Settings too low.	Increase setting.
	Check thermostat location.	Bad location due to heat build up.	Move thermostat to a better location.
	Check thermostat calibration.	Out of calibration.	Recalibrate. Level thermostat.
Flow Valve	Check flow valve for sticking in partially closed position.	Flow valve not opening fully.	Clean or replace flow valve.
Radiation	Check for air in radiators.	Radiators airbound.	Bleed radiators.
	Check to see if radiators are sized properly.	Radiators inadequate.	Install adequate radiation.
Boiler	Determine structure heat load.	Boiler too small.	Additional heating capacity.
Piping	Check to see if piping is sized properly.	Piping inadequate.	Install adequate piping.
Heat Exchanger	Check heat exchanger for soot or scale accumulation.	Insufficient heat transfer.	Clean heat exchanger.
Burner	Check pump pressure with pressure gauge.	Insufficient pump pressure.	Increase pressure according to installer/serviceman labels for Series I & II boilers.
Nozzle	Check nozzle for size and spray angle.	Wrong nozzle installed.	Install specified nozzle.
	Check for faulty nozzle.	Nozzle underfiring due to defective nozzle.	Replace nozzle.

TROUBLE: HIGH NET STACK TEMPERATURES

SOURCE	PROCEDURE	CAUSES	REMEDY
Nozzle	Check pump pressure with pump gauge.	Nozzle overfiring due to high pump pressure.	Reduce pump pressure according to installer/serviceman labels for Series I & II boilers.
Heat Exchanger	Check heat exchanger surfaces for soot or scale fouling.	Heat exchanger fouled.	Clean heat exchanger.
Baffles	Check baffles installed.	Baffles not installed.	Install baffles.

TROUBLE: INSUFFICIENT DOMESTIC HOT WATER

SOURCE	PROCEDURE	CAUSES	REMEDY
Tankless Coil	Analyze capacity vs. usage.	Insufficient coil capacity.	Install larger coil.
Operating Control	Check operating control.	Setting too low.	Set operating control to 180°F. Raise differential set point.
Heat Exchanger	Inspect coils for fouled surfaces and/or flow restrictions.	Flow restriction.	Remove restriction.
		Fouled surfaces on heat exchanger.	Clean heat exchanger surfaces.

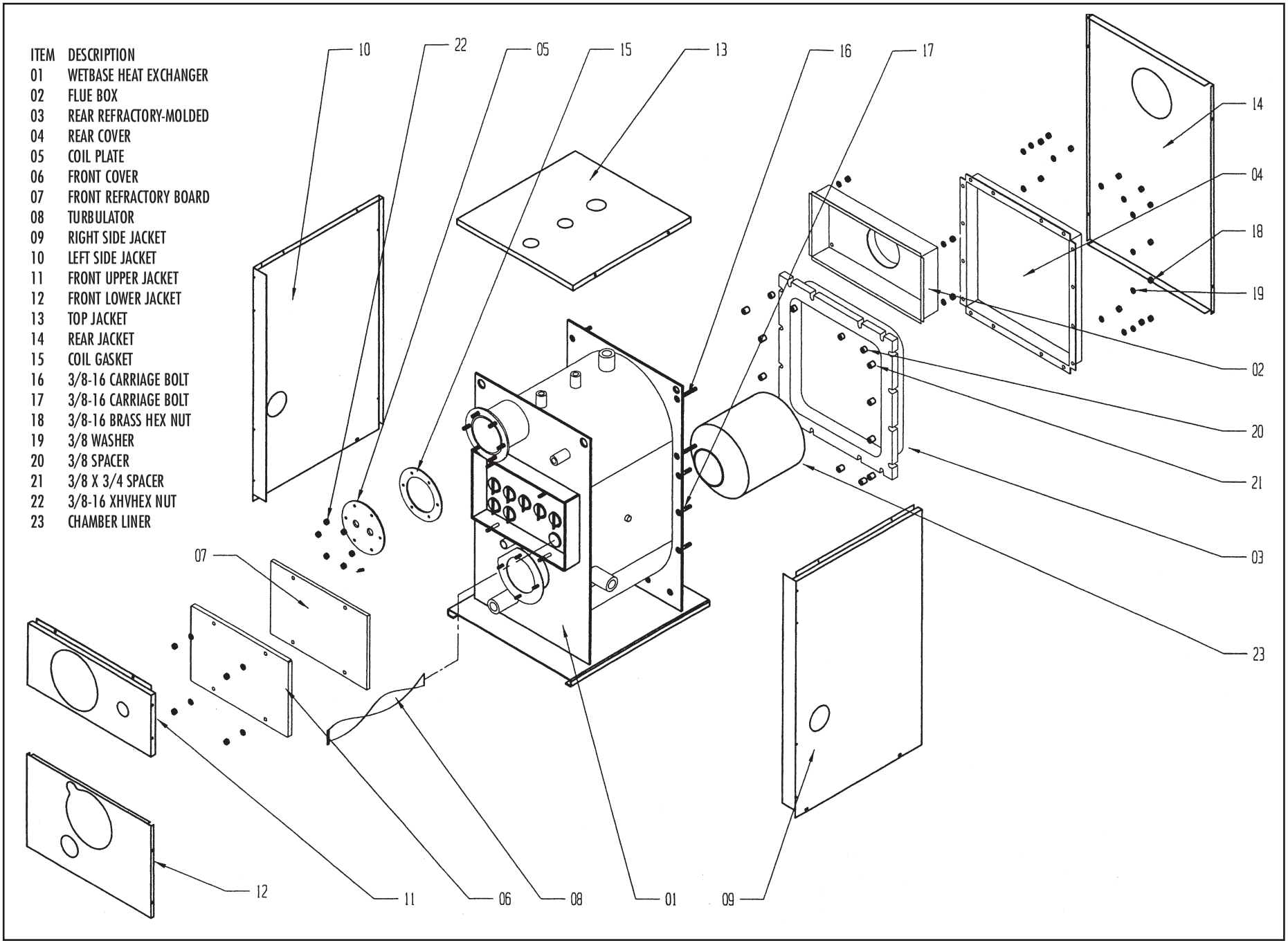


Figure No. 10 - Exploded Parts View

Parts List

For Models 90/100/110 & 125/135/150

(Designate boiler and burner model numbers on all orders).

Item No.	Description	Part No.
1	90/100/110 Heat Exchanger	241800
2	125/135/150 Heat Exchanger	819060
3	Flue Box	819024
4	Rear Refractory - Molded, Target Wall Only	819016
5	Rear Cover with Molded Refractory Assembly	819014
6	Coil Plate - Blank	229151
7	Coil - 5 GPM cartoned with Gasket	530677
8	Front Cover	819020
9	Front Refractory Board 3/4"	819022
10	Turbulator (10 for 90-110, 16 for 125-150)	819018
11	Right Side Jacket	819006
12	Left Side Jacket	819008
13	Front Upper Jacket	819004
14	Front Lower Jacket	819000
15	Top Jacket	819010
16	Rear Jacket	819012
17	Coil Gasket	481005
18	Chamber Liner	337410

Parts List

For Models 165/175/200 & 225/250/275

(Designate boiler and burner model numbers on all orders).

Item No.	Description	Part No.
1	165/175/200 Heat Exchanger	241800
2	225/250/275 Heat Exchanger	241810
3	Flue Box	241366
4	Rear Refractory - Molded, Target Wall Only	337416
5	Rear Cover with Molded Refractory Assembly	241360
6	Coil Plate - Blank	229151
7	Coil - 5 GPM cartoned with Gasket	530245
8	Front Cover	241350
9	Front Refractory Board 1"	337415
10	Turbulator (10 for 90-110, 16 for 125-150)	241155
11	Right Side Jacket	501225
12	Left Side Jacket	501225
13	Front Upper Jacket	501225
14	Front Lower Jacket	501225
15	Top Jacket	501225
16	Rear Jacket	501225
17	Coil Gasket	481005
18	3/8" - 16 x 4" Carriage Bolt (Qty. 4)	311113
19	3/8" - 16 x 2" Carriage Bolt (Qty. 12)	311110

Preliminary Settings

INSTALLER/SERVICEMAN

Model Number	WB-90	WB-100	WB-110
Burner Type	Beckett	Beckett	Beckett
Burner Model	AFG	AFG	AFG
Nozzle Type	.75 80°B	.85 80°B	.90 80°B
Pump Pressure PSI	140	140	140
Head/Pin Position	F-3	F-3	F-3
Air Band	CLOSED	2	3
Air Shutter	10	10	10
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-90	WB-100	WB-110
Burner Type	Beckett	Beckett	Beckett
Burner Model	AFII	AFII	AFII
Nozzle Type	.75 60B	.85 60B	.90 60B
Pump Pressure PSI	140	140	140
Head/Pin Position	3	3	3
Air Band	3	4	4.5
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-90	WB-100	WB-110
Burner Type	Carlin	Carlin	Carlin
Burner Model	EZ-1	EZ-1	EZ-1
Nozzle Type	.75 60A	.85 60A	.90 60A
Pump Pressure PSI	140	140	140
Head/Pin Position	.85-1.00	.85-1.00	1.10-1.25
Air Band	100	100	125
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-90	WB-100	WB-110
Burner Type	Riello	Riello	Riello
Burner Model	F5	F5	F5
Nozzle Type	.75 60B	.85 60B	.90 60B
Pump Pressure PSI	150	150	150
Head/Pin Position	1.5	2.0	2.5
Air Band	N/A	N/A	N/A
Air Shutter	2.0	2.5	2.75
Draft Over Fire	+.04"	+.06"	+.08"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-90DV	WB-100DV	WB-110DV
Burner Type	Beckett	Beckett	Beckett
Burner Model	AFII	AFII	AFII
Nozzle Type	.75 60B	.85 60B	.90 60B
Pump Pressure PSI	140	140	140
Head/Pin Position	3	3	3
Air Band	3	4	4.5
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-90DV	WB-100DV	WB-110DV
Burner Type	Carlin*	Carlin*	Carlin*
Burner Model	EZ-1	EZ-1	EZ-1
Nozzle Type	.75 60A	.85 60A	.90 60A
Pump Pressure PSI	140	140	140
Head/Pin Position	.85-1.00	.85-1.00	1.10-1.25
Air Band	100	100	125
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

*Requires Carlin Air Intake Adapter

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-90DV	WB-100DV	WB-110DV
Burner Type	Riello	Riello	Riello
Burner Model	BF5	BF5	BF5
Nozzle Type	.75 60B	.85 60B	.90 60B
Pump Pressure PSI	150	150	150
Head/Pin Position	1.5	2.0	2.5
Air Band	N/A	N/A	N/A
Air Shutter	3.5	4.0	4.5
Draft Over Fire	0 TO .10"	0 TO .10"	0 TO .10"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-125	WB-135	WB-150
Burner Type	Beckett	Beckett	Beckett
Burner Model	AFG	AFG	AFG
Nozzle Type	1.00 80°B	1.10 80°B	1.25 80°B
Pump Pressure PSI	140	140	140
Head/Pin Position	F-6	F-6	F-6
Air Band	2	4.5	6
Air Shutter	10	10	10
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-125	WB-135	WB-150
Burner Type	Beckett	Beckett	Beckett
Burner Model	AFII	AFII	AFII
Nozzle Type	1.00 60B	1.10 60B	1.25 60B
Pump Pressure PSI	140	140	140
Head/Pin Position	7	7	8
Air Band	3	4	8
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-125	WB-135	WB-150
Burner Type	Carlin	Carlin	Carlin
Burner Model	EZ-1	EZ-1	EZ-1
Nozzle Type	1.00 60A	1.10 60A	1.25 60A
Pump Pressure PSI	140	140	140
Head/Pin Position	1.1-1.25	1.35-1.5	1.35-1.5
Air Band	125	150	150
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+.085"	+.085"	+.085"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-125	WB-135	WB-150
Burner Type	Riello	Riello	Riello
Burner Model	F5	F5	F5
Nozzle Type	1.00 60B	1.10 60B	1.25 60B
Pump Pressure PSI	150	150	150
Head/Pin Position	2.5	3.5	4.0
Air Band	N/A	N/A	N/A
Air Shutter	3.0	3.5	4.5
Draft Over Fire	+.03"	+.05"	+.07"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB DV-125	WB DV-125	WB DV-125
Burner Type	Beckett	Carlin*	Riello
Burner Model	AFII	EZ-1	BF5
Nozzle Type	1.00 60°B	1.00 60°B	1.00 60°B
Pump Pressure PSI	140	140	140
Head/Pin Position	7.0	0.85-1.00	2.0
Air Band	100	100	125
Air Shutter	N/A	N/A	N/A
Draft Over Fire	+0.16"	+0.14"	+0.13"
Draft In Stack	+0.08"	+0.07"	+0.07"
CO_2 Reading	10-11.5%	10-11.5%	10-11.5%
Smoke Reading	ZERO	ZERO	ZERO

***Requires Carlin Air Intake Adapter**

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-165	WB-175	WB-200
Burner Type	Beckett	Beckett	Beckett
Burner Model	AFG	AFG	AFG
Nozzle Type	1.50 60B	1.65 60B	1.75 60B
Pump Pressure PSI	140	140	140
Head/Pin Position	M-2	M-3	M-3
Air Band	5	5	7
Air Shutter	OPEN	OPEN	OPEN
Draft Over Fire	+.06"	+.08"	+0.10"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTE: Pressure over fire will vary according to CO_2 setting.

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

INSTALLER/SERVICEMAN

Model Number	WB-225	WB-250	WB-275
Burner Type	Beckett	Beckett	Beckett
Burner Model	CF-375	CF-375	CF-375
Nozzle Type	2.00 60B	2.25 60B	2.50 60B
Pump Pressure PSI	140	140	140
Head/Pin Position	3	3	4
Air Band	3	6	6
Air Shutter	OPEN	OPEN	OPEN
Draft Over Fire	+.06"	+.09"	+0.11"
Draft In Stack	-0.02"	-0.02"	-0.02"
CO_2 Reading	10-11.5	10-11.5	10-11.5
Smoke Reading	ZERO	ZERO	ZERO

NOTE: Pressure over fire will vary according to CO_2 setting.

NOTICE

Above settings are approximate. Final adjustments to be made with proper test equipment. Be sure all oil lines are air free and the use of flare fittings is recommended. See installation/service manual for detailed information.

BURNER SERVICE SET-UP RECORDS

	Initial Set Up 1	2	3	4	5
1. Date					
2. Model Number					
3. Firing Rate					
4. Pump Pressure*					
5. CO2					
6. “0” Smoke					
7. Gross Stack °F					
8. Draft Over Fire					
9. Replaced Filter Yes/No					
10. Replaced Nozzle Yes/No					
11. Clean Pump Filter Yes/No					
12. Inspect Coil Gasket					
13. Check for Leaks @ plugs/fittings					
14. Brush Clean Flue Tube Passages					
15. Vacuum Chamber/Flue Tubes					
16. Clean Blower Wheel					
17. Check/Set Electrodes					

*See pump pressure according to the installer/serviceman labels for Series I and II boilers starting on page 30.